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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,755	03/13/2001	Samson X. Huang	10559-361001	2735

7590

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EXAMINER

SHENG, TOM V

ART UNIT	PAPER NUMBER
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2673

DATE MAILED: 01/16/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/805,755

Applicant(s)

HUANG ET AL.

Examiner

Tom V Sheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 16-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14 is/are rejected.
- 7) ☒ Claim(s) 13 and 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Claims 16-22 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

Claim Rejections - 35 USC § 112

2. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, limitations "2^N" in line 1, "2^S" in line 3 and "2^{N-S}" in line 7 are indefinite because the properties and ranges of S and N are not defined.

In claim 2, limitation "2^S/N" in line 3 is indefinite because the applicant is defining a fraction value, which needs to be defined as a fraction of a period or a waveform. Further, it appears the form "2^S/N" is a typo and should actually be "2^S/2^N" or the value would be bigger than 1 in certain instances.

Claims 2-6 are rejected as dependent on claim 1.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 12 is rejected under 35 U.S.C. 102(e) as being anticipated by Jacobson et al. (US 6,445,489 B1).

As for claim 12, Jacobson teaches a method of intensity control of a pixel (grayscale electrophoretic display; see figures 4 and 5; column 8, line 16 to column 9, line 12), comprising:

applying a first pulse with a first width to a first subpixel (by actuating the sub-pixel with a capacitor with a long pulse of low-intensity light) of the pixel to produce a first gray-scale tone; and applying a second pulse with the first width to the first subpixel and a second subpixel of the pixel to produce a second gray-scale tone (by actuating both the sub-pixel lacking a capacitor and the sub-pixel with a capacitor with a long pulse of high-intensity light).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson as applied to claim 12 above, and further in view of Hughes et al. (US 5,905,482).

As for claim 14, Jacobson teaches the first and second pulses as recited in claim 12. However, Jacobson does not teach a third pulse with a second width about twice the first width to the first subpixel and the second subpixel to produce a fourth gray-scale tone.

Hughes teaches in temporal dither that a gray value simply depends on the ratio of black to white time (i.e., the longer the pulse duration the higher the gray value). See column 2, lines 16-23. Since the third pulse is just a doubling of the second pulse that serves to double the grayscale intensity, one of ordinary skill in the art would recognize the use of this third pulse as simply another gray value.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to create a third pulse being twice the second pulse in order to provide another gray value in display.

7. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson in view of Hughes et al. (US 5,905,482).

As for claim 7, Jacobson teaches a system for intensity control of a pixel (grayscale electrophoretic display; see figures 4 and 5; column 8, line 16 to column 9, line 12), comprising:

a first subpixel (sub-pixel with a capacitor); a second subpixel (sub-pixel lacking a

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capacitor); and a driver (driving from light emitting layer 10) to apply a pulse-width modulated waveform to the first subpixel and the second subpixel (individual sub-pixel is actuated by varying levels of duration of light drive and light intensity), the modulated waveform having a first pulse (long pulse of low-intensity light) and a second pulse (long pulse of high-intensity light), the first pulse being applied to the first subpixel and the second pulse being applied to the first subpixel and the second subpixel (as described in column 9, lines 6-9).

Jacobson does not teach that the first subpixel and the second subpixel having a light output ratio of about 1:1.

Hughes also teaches combining temporal and spatial weighting in order to enhance grayscale display (Abstract). Hughes teaches in spatial weighting that each pixel can be formed by combinations of two or more subpixels of the same or different sizes (column 3, lines 55-60). Subsequently, each subpixel can be addressed with different levels of grayscale (column 4, lines 28-30). For example, see figure 15, where subpixels of same size and different sizes are used in spatial weighting (column 11, lines 30-62).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide the first and second subpixels having a light output ratio of 1:1 because this is the most straightforward approach to gradation display.

As for claim 8, Jacobson uses the long pulse for both the first pulse and the second pulse and thus having the same pulse width.

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As for claim 9, the third pulse is just a doubling of the second pulse that serves to double the grayscale intensity. Hughes teaches in temporal dither that a gray value simply depends on the ratio of black to white time (i.e., the longer the pulse duration the higher the gray value). See column 2, lines 16-23. One of ordinary skill in the art would recognize the use of a third pulse as simply another gray value.

As for claim 10, Jacobson's long pulse of low-intensity and long pulse of high-intensity have different intensity thus unequal amplitude.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson and Hughes as applied to claim 7 above, and further in view of Green (US 5,124,695).

As for claim 11, Jacobson, as modified by Hughes, teaches subpixels of same or different sizes but does not teach the first subpixel and the second subpixel being concentric.

Green teaches the areas of subpixels being arranged in a concentric manner, since such subpixels have essentially the same average position and would have no disturbing effect on the eye when viewing a display (figure 1; column 1, lines 24-41).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate concentric subpixel arrangement of Green in modified Jacobson's invention, thus further eliminating unwanted positional effect of the subpixels on the eye when viewing a display.

Allowable Subject Matter

9. Claims 1-6 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

10. Claims 13 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: none of the prior arts of record teaches the limitations "a driver to apply a pulse-width modulated waveform to the subpixels, the modulated waveform having 2^{N-S} pulses of different pulse widths" of claim 1, limitation regarding the third gray-scale tone of claim 13 and limitation regarding the fifth grayscale tone of claim 15.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V Sheng whose telephone number is (703) 305-6708. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (703) 305-4938. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

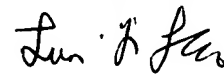
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Tom Sheng
January 9, 2004

Lun-Yi Lao
Primary Examiner

A handwritten signature in black ink, appearing to read "Lun Yi Lao", written in a cursive style.